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RURAL PEDIATRIC PRIMARY CARE PRACTICE PATTERNS AS A RESULT OF AN ON-SITE BEHAVIORAL HEALTH CONSULTANT: A RETROSPECTIVE ANALYSIS

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RURAL PEDIATRIC PRIMARY CARE PRACTICE PATTERNS AS A RESULT OF AN ON-SITE BEHAVIORAL HEALTH CONSULTANT: A RETROSPECTIVE ANALYSIS

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By

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Abstract

Nationally, it has been estimated that 10 to 21% of children with psychosocial concerns are seen in primary care settings (Jellinek et al., 1999; McInerny, Szilagyi, Childs, Wasserman & Kelleher, 2000; Palermo et al., 2002). Often, however, children go undiagnosed with/treated for psychosocial concerns in pediatric primary care due to lack of physician time and poor referral rates to mental health providers. Evaluations of integrated care models, in which a behavioral health consultant is present in primary care practices, has shown to increase the availability of mental health services (Stancin, Perrin, & Ramirez, 2009). Using extant data from patient records extracted by a trained nurse, this study aims to assess practice scheduling habits and seasonal variation in behavioral health consultant (BHC) usage on days when a BHC is present versus non-BHC days in one rural pediatric office over the course of four years. This study aims to evaluate economic efficiency based on the number of patients scheduled per day. It is hypothesized that the presence of an onsite BHC will increase patient volume and, thus, economic efficiency. Information gathered from the clinic's electronic scheduling system included: 1) the number of patients scheduled on a BHC day and 2) the number of patients scheduled on a non-BHC day for each week of the BHC's employment. These data—both overall and by year and season—were analyzed using one-way ANOVA and post hoc Tukey testing. There were no significant differences in scheduled patient volume found between the day types overall. However, yearly analysis revealed significant differences between 2010 and 2012, 2013, and 2014 on BHC days and between 2010 and 2014 on non-BHC days. When examined by season, significant differences were found between Fall/Winter and Spring/Summer on both day types in post hoc Tukey testing. These findings have important implications for the trajectory of benefits provided by a BHC in a rural integrated care model.

Introduction

Integrated approaches in pediatrics seek to solve complex patient and parent concerns using joint application of primary care and psychology. An integrated care approach incorporates psychologists or mental health providers in primary care settings. This approach allows for interventions that can be delivered over a brief time period in a setting where patients frequently present with psychosocial and behavioral concerns (Rodrigue, 1994). In a pediatric primary care context, brief targeted interventions for children with common behavioral issues such as toilet training and psychosomatic issues decreases the need for medical care (Finney et al., 1991).

Primary care has been well identified as the principle delivery method for pediatric mental health services throughout the United States (Kelleher, McInerny, Gardner, Childs, & Wasserman, 2000). Pediatricians are often the first medical professionals to have contact with young children and their families and have the ability to evaluate children over regular time intervals during well-child visits. Several studies illustrate that pediatricians spend 25 to 60% of their time in well-child visits in which the focus is on identification and treatment of behavioral problems and assessment of development (Brazelton, 1975). Primary care providers in pediatrics are also in the position to encounter pre-clinical concerns that do not yet fit the DSM-5 criteria for a psychiatric disorder and can provide preventative guidance and early intervention before the emergence of psychopathology (AAP, 2013).

Furthermore, more individuals with psychosocial and behavioral concerns are seen in primary care than in avenues specialized in mental health (Regier, Goldberg, & Taube, 1978). More specifically, national samples estimate the prevalence of pediatric behavioral and mental concerns at 10 to 21% (Jellinek et al., 1999; McInerny, Szilagyi, Childs, Wasserman & Kelleher, 2000; Palermo et al., 2002). Lavigne et al. (1996) found prevalence rates of all psychosocial

disorders in primary care to be 21.4% and 9.1% for severe disorders in children ages 2-5 years. Although many children present with psychosocial concerns in primary care, several barriers prevent adequate diagnosis and treatment of these issues. Some of these barriers include: 1) physician's lack of time and training to diagnose and treat psychosocial concerns and 2) lack of or inadequate referral follow-through by patients (Perrin & Stancin, 2002; Kazdin, 1996). Therefore, the majority of children with psychosocial problems do not receive the needed treatment (US Public Health Service, 2000).

Without adequate attention and intervention, psychosocial concerns in early childhood could lead to increased behavioral problems in remaining childhood years as well as the development of psychopathology in adolescence and adulthood (Frick & Lonely, 1999; Hofstra, Ende, & Verhulst, 2002; Anda et al., 2007). In addition, psychosocial concerns have been shown to have negative impacts in multiple settings including school, home, and public settings. In adulthood, unaddressed concerns from childhood contribute to unemployment, substance dependence, and increased delinquent behaviors (Barlow & Stewart, 2000).

Medical and mental health symptoms often overlap, making differentiation between psychosocial and physical variables especially difficult in pediatrics. It is known that mentally distraught patients exhibit more physiological symptoms, and patients with more severe physiological symptoms are at increased risk for a psychological diagnosis (Katon, VonKorff, & Lin, 1990; Kroenke, Spitzer, Williams, Linzer, Hahn, deGruy, & Brody, 1994). Studies have also found that children are equally susceptible to such statistics. It has been found that children with chronic illnesses have rates of psychological issues 1.5 times greater than the rates found in children without such health problems (Gortmaker et al., 1990). Furthermore, children with behavioral or psychosocial concerns are more likely to seek out medical clinics than those

without psychosocial problems (Costello, 1986). Thus, the dichotomization of medical and mental health care can lead to incomplete care and increased effort on the part of both physician and patient (deGruy, 1997).

One of the specific barriers that limit treatment of psychological and behavioral concerns in pediatrics is lack of physician time (Perrin & Stancin, 2002). At least half of pediatric appointments for 43% of well-child visits and 35% of acute visits contain behavioral health discussions, leading to the addition of 5-7 unanticipated minutes to each child's appointment (Cooper et al., 2006). Other studies indicate a 10 minute increase of each appointment due to behavioral concerns addressed by pediatric residents (Gouge, Polaha, & Powers, in preparation). Significant pressure is placed on pediatric primary care providers to schedule a high volume of patients per day. As a result of this pressure and the additional time needed to adequately address psychosocial and behavioral concerns, many mental health concerns are not addressed or addressed inadequately, and the unanticipated additional time needed to address behavioral concerns can negatively impact the time allotted for other appointments (Cooper et al., 2006). All of these consequences can lead to a reduced number of patients scheduled per day which negatively impacts overall patient care and clinic revenue. One possible solution to this problem is the incorporation of mental health services into pediatric primary care (Stancin, Perrin, & Ramirez, 2009; Tolan & Dodge, 2005).

There are several commonly utilized models for integrated care. The independent functions model is a close comparison to the traditional medical consultation model in which the pediatric primary care provider seeks out professional opinions as needed. Psychologists assess, diagnose, and treat psychological concerns only when the patient is referred by the pediatrician. Minimal communication between the psychologist and pediatrician takes place (Drotar, 1995).

The disadvantages to this model are less than optimal diagnosis and treatment of psychosocial concerns including: 1) lack of physician-parent discussion concerning behavioral concerns and 2) high no-show rates to mental health providers after a referral is made (Hacker et al., 2006).

Another approach to integrated care, the indirect consultation model, is also referred to as the process-educative model (Stabler, 1979). This approach allows the pediatrician sole responsibility for clinical management of the patient and patient/parent education. The pediatrician consults a mental health professional privately in hallways, over phone or email, and in conference settings, and the patient is never referred to the psychologist and seen by the psychologist directly (Drotar, 1995). Although no-show rates are obviously greatly reduced using this approach, it produces high levels of frustration among both medical and mental health providers because complex cases cannot be seen by both providers directly (Drotar, 1995). Therefore, the sole use of this approach is not commonly used.

Yet another approach, the collaborative team model, often occurs in a team-setting where the responsibilities and decision making of patient care is shared between psychologists and pediatric primary care providers (Drotar, 1995). Strosahl (1998) describes an optimal model in which mental health services occur in sync with the variety and volume of pediatric concerns. Like other models previously mentioned, psychologists work as consultants to pediatricians and provide short (20-30 minute) evidence-based treatments to the patient in question that has specific behavioral concerns. Using this approach, mental health providers are available to take on-the-spot referrals that interrupt their normal schedule of patients (Strosahl, 1998). Endorsed by the American Academy of Pediatrics and the American Academy of Child and Adolescent Psychiatry, this model makes behavioral health providers directly available and may decrease

time demanded by psychosocial concerns by offering immediate access to specialty psychological services (AAP, 2013).

Demonstration projects of integrated care models have become more frequent within the last 10-15 years (Valleley, Kosse, et al., 2007). These studies have shown that integrated care models result in increased positive outcomes such as increased physician time and increased access to mental health care (e.g., Conner et al., 2006; Williams, Shore, & Joy, 2006; AAP, 2009). In fact, the American Academy of Pediatrics (AAP) and the American Academy of Child and Adolescent Psychiatry (AACAP) state that assessment and treatment of psychosocial concerns should be addressed within the child's primary care facility, and behavioral health providers located within pediatric primary care settings are recommended (AAP, 2013).

Psychologists in integrated care settings are well positioned to increase effective practice habits. Even though there is evidence that integrated care is generally clinically effective, little is known about the direct effects on pediatric practices. Therefore, it is necessary to demonstrate that implementation of integrated services in pediatrics increases quality of care by allowing more patients to be scheduled per day while adequately addressing behavioral and psychosocial concerns. This study is a retrospective analysis of pediatric primary care scheduling habits over four years of behavioral health consultant (BHC) employment.

Recently, in a ground-breaking study, Gouge and Polaha (2013) illustrated that patient volume increased by 42% on days when a BHC was present relative to non-BHC days, even when accounting for BHC availability and pre-scheduled appointments. Patient volume increased because physicians were able to accept walk-ins and schedule patients with medical-only concerns while psychosocial concerns were addressed by the BHC. As hypothesized, this increase in business increased profits by over $1,000 on BHC days. These findings are the first

of their kind, however, many questions remain about the mechanisms by which the additional profit was realized. In particular, because this study was initiated in the fourth year of the clinic using a BHC, the results could be due to refinement of a specific integration style. A retrospective study of practice habits around use of the BHC and scheduling will shed light on how the profit identified in Gouge and Polaha was realized.

Aims

This study aims to assess practice scheduling habits on BHC days versus non-BHC days in a rural pediatric clinic over the course of four years. In particular, we are interested in following up on the results of Gouge & Polaha (2013) to determine if/demonstrate that, over four years, the practice became more efficient at scheduling patients to capitalize on the availability of the BHC. In other words, we aim to demonstrate an increase of patients seen by the primary care providers overall on BHC days (i.e., not the BHC's patients). Overall, we hypothesize that these data will demonstrate that, over time, the practice altered their scheduling habits to maximize their use of time on BHC days thereby (as demonstrated by Gouge & Polaha) offsetting costs. We will also examine seasonal variation in BHC usage in order to evaluate the efficiency of a rural integrated health model.

Procedure

The clinic employed the BHC, an advanced clinical psychology graduate student, for one day each week during regular clinic hours. The BHC worked on both Mondays and Thursdays over the time period analyzed. Providers utilized the BHC for consultations concerning recommendations and advice for patients, on-the-spot referrals of patients with behavioral concerns, and to schedule future appointments within the BHC's schedule. For the entire four years of the BHC's employment, she was stationed near the highly centralized nurse's station in the clinic in order to facilitate incorporation into daily practice.

Since this study is a retrospective review of the clinic's electronic scheduling system, the ETSU IRB determined that this study was not human research and did not need their approval. In order to collect data, a nurse employed at the clinic was paid to extract information from scheduling records over the course of the BHC's employment. Information gathered from scheduling records included: 1) number of patients seen on a BHC work date, 2) number of patients seen on a non-BHC work date for each week of the BHC's four year employment beginning on January 18, 2010 and ending on March 14, 2014. The 356 days (one BHC day and one non-BHC day for 178 weeks) examined were compared using a one-way ANOVA ($p = 0.05$). The data was also examined by year and by season for both BHC days and non-BHC days using a one-way ANOVA ($p = 0.05$).

Results

Across the 356 days (four years, once weekly) for which the number of scheduled patients for BHC days and non-BHC days were recorded, 8741 patients were scheduled on BHC days while 9164 patients were scheduled on non-BHC days. BHC day results indicate that 49.12 patients were scheduled on average, and non-BHC days resulted in a scheduled patient mean of 51.48 patients. Table 1 depicts overall scheduled patient volume by BHC days vs. non-BHC days.

Table1. Number of Patients Scheduled Overall on BHC Days vs. non-BHC Days

	N	Mean	Standard Deviation
BHC Days	8741	49.12	13.92
Non-BHC Days	9164	51.48	13.87

To determine if scheduled patient volume overall differed significantly between BHC days and non-BHC days, several statistical tests were completed. A one-way ANOVA revealed no significant main effect between patient volume and day type ($F = 5.68$).

When compared by year, the data illustrates a general increase in scheduled patient visits on both BHC days and non-BHC days. The greatest increase in scheduled patient volume for both day types occurred between 2010 and 2011. Table 2 depicts yearly data by day type.

Table 2. Number of Patients Scheduled by Year on BHC Days vs. Non-BHC Days

Year	N		Mean		Standard Deviation	
	Non-BHC	BHC Day	Non-BHC	BHC Day	Non-BHC	BHC Day
2010	1634	1448	46.69	41.37	12.06	9.54
2011	2217	2069	50.39	47.02	16.42	12.80
2012	2492	2490	53.02	52.98	12.31	13.25
2013	2207	2154	52.55	51.29	12.70	15.76

A one-way ANOVA yielded a significant main effect of day type on year. Furthermore, post hoc Tukey testing revealed a significant difference between 2010 and 2012 ($p = 0.001$) and 2010 and 2013 ($p = 0.011$) on BHC days. On non-BHC days, no significant main effect between years was found.

Our third aim was to examine seasonal variation in BHC utilization across all four years of the BHC's employment. Seasonal date ranges were determined using official equatorial start dates for each year in question. When split by season, the data illustrates the highest scheduled

patient volume in fall and winter and lowest volumes in spring and summer comparatively. Table 3 illustrates these observations.

Table 3. Scheduled Patient Volume by Season on BHC Days vs. Non-BHC Days

Season	N		Mean		Standard Deviation	
	Non-BHC	BHC Day	Non-BHC	BHC Day	Non-BHC	BHC Day
Winter	2371	2492	54.13	54.17	15.33	13.56
Spring	2027	1908	47.14	43.44	9.57	9.21
Summer	1983	1914	44.39	43.55	11.36	11.65
Fall	2694	2465	59.87	54.78	13.11	15.99

For both BHC and non-BHC days, a one-way ANOVA revealed a significant difference between seasons by day type. More specifically, winter differed significantly from spring ($p = 0.001$) and summer ($p = 0.001$), and fall differed significantly from spring ($p = 0.000$) and summer ($p = 0.000$) in post hoc Tukey testing. However, no significant differences were found between winter and fall or spring and summer.

Discussion

This study evaluated practice scheduling habits in a rural, independent pediatric primary care practice that utilized a once weekly BHC working as a team with the medical provider to provide patient care. The BHC provided brief (20-30 min.) interventions. Currently, the literature on integrated models of pediatric care do not shed much light on how the benefits (time savings, increased revenue, etc.) seen in such a model are realized. . Since Gouge and Polaha (2013) was conducted in the fourth year of this clinic's use of a student BHC questions remained

about how the 42% increase in patient volume and subsequent $1000 in additional revenue were realized. We hypothesized that the clinic refined their scheduling habits over time to best utilize the BHC. That is, over time, the clinic created more patient volume and increased revenue by scheduling more patients on BHC days than on non-BHC days.

In our study model, more complex psychosocial and behavioral concerns were pre-scheduled to see the BHC, while cases presented in medical appointments were seen by on-the-spot referrals. Theoretically, this method allows for the most efficient use of clinic time wherein the patients with the most need are pre-scheduled with the BHC, allowing the other providers to focus on medical-only concerns. However, our hypotheses and these assumptions were not supported by the current study.

While there was a general increasing trend in patients scheduled on both day types over time, data showed no significant differences in the number of patients scheduled on BHC days vs. non-BHC days overall in the course of the BHC's employment. However, when broken up by year, there were significant differences found between the number of patients scheduled on BHC days between 2010 and 2012, 2013, and 2014, suggesting that there is in fact an adjustment/accommodation period for the clinic to learn how to best employ the BHC's services. Additionally, the volume of patients scheduled on non-BHC days was only significantly different between 2010 and 2014, suggesting a more long-term benefit trajectory in terms of increased scheduled volume of acute visits.

Seasonal variation in BHC usage was also demonstrated with significant differences present between fall/winter and spring/summer. These results are most likely caused by the start of a school year in which teachers come into contact with a set of new students, allowing for

increased awareness/vigilance of behavioral concerns. However, the same results were seen for non-BHC days.

Although differences between years and seasons exist, our main hypothesis was not supported. By large, more patients were not scheduled on BHC days vs. non-BHC days.. However, this retrospective study and further analyses shed light on the trajectory of benefits realized by utilizing a BHC in pediatric primary care. By evaluating practice scheduling habits across all four years on the BHC's employment, these results can inform both BHCs and their potential employers about their long term financial risks/gains associated with building a new collaborative relationship with the expectation that cost-benefits may not occur until years down the road.

Although meant to address one of the limitations in Gouge and Polaha (2013), this study is subject to several of its own limitations. First, this study was an evaluation of a rural integrated care model implemented in a private pediatric clinic in Virginia that used a once weekly psychology graduate student for BH services. Therefore, the results have little generalizability to larger, urban practices or to practices that do not specialize in pediatrics as well as to those that have a BHC with differing experience/credentials and those that employ a BHC for more than one day per week. Furthermore, since we only examined pre-scheduled appointments within the clinic's electronic scheduling system, data concerning handoffs to the BHC were not recorded, leading to an incomplete representation of BHC patient volume.

Furthermore, additional research is needed to clarify the findings in this study. Specifically, the number of providers working on each day in which data was collected would be beneficial to answer questions like: "were there less providers working on BHC days vs. non-BHC days?" and "what were the behavioral health training levels of the medical providers

working on BHC days vs. non-BHC days?" Also, additional information concerning the number of patients seen by both the BHC and the medical providers separately would be helpful in determining daily usage of the BHC.

The findings in this study also raise questions about the types of concerns seen on BHC days vs. non-BHC days. It could be the case that the BHC yielded a greater dichotomization of concerns seen on both day types. That is, more medical/acute concerns were seen on non-BHC days, and more behavioral/psychosocial concerns were addressed on BHC days. It could also be that the BHC allowed for more acute visits per day seen by medical providers in general rather than necessarily allowing for increased clinic patient volume on days in which the BHC was onsite. In summary, additional data collection addressing the following questions is being completed for each day in question: 1) how many providers were working, 2) how many patients were seen by the BHC and the provider separately, and 3) how many acute visits were addressed?

Although the findings are inconclusive with past research and have limited generalizability, it is important to notice their importance in identifying the trajectory of BHC benefits in a pediatric rural integrated care model. These findings have implications in shaping the building of a collaborative approach, allowing BHCs and their employers to be aware of the time table necessary to implement integrated care in pediatrics. Further research will aid in clarifying BHC benefits.

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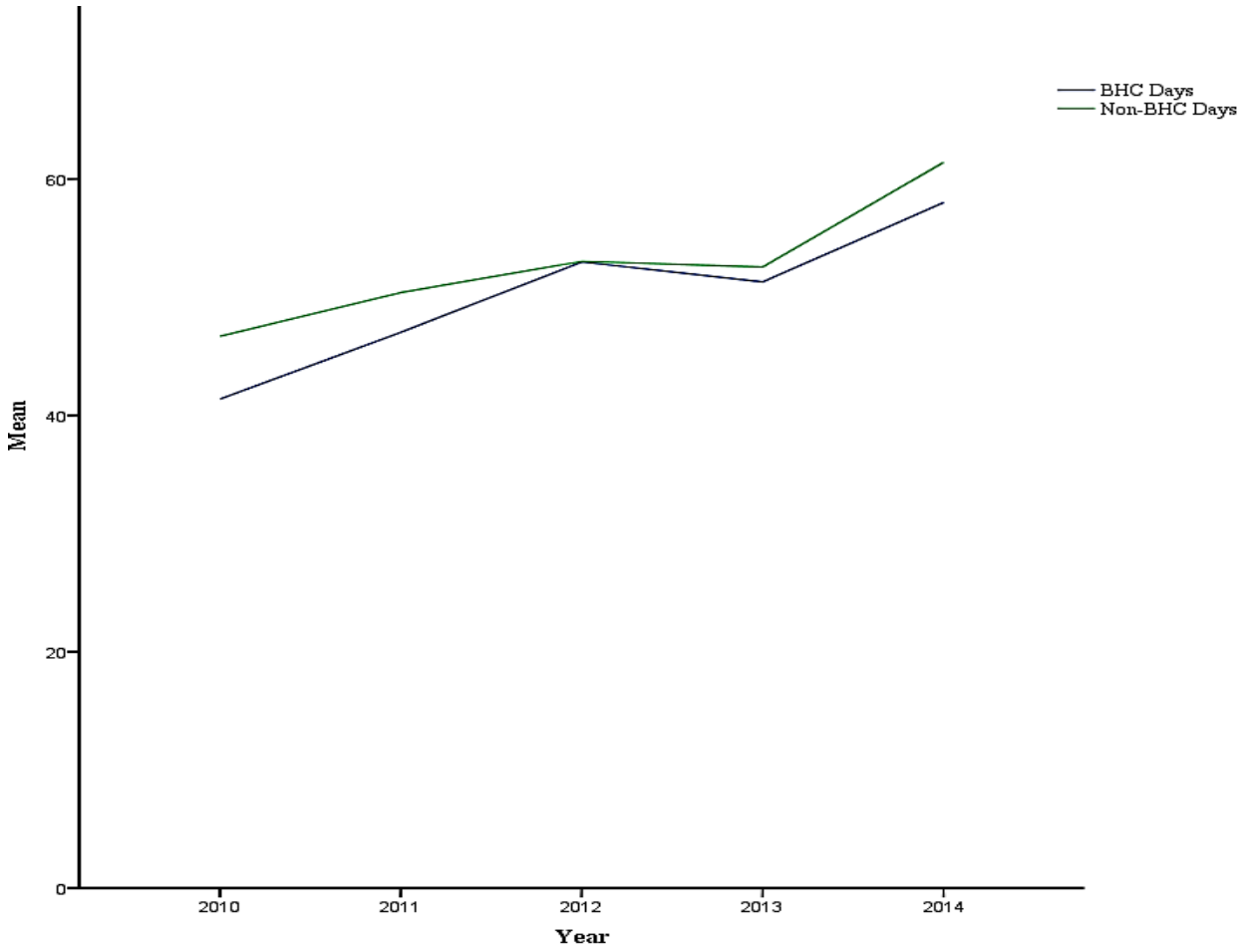
Appendix

Average Patients Scheduled per Year on BHC vs. Non-BHC Days



Average Patients Scheduled by Season on BHC vs. Non-BHC Days